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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/809,043	03/16/2001	Nobuo Aoi	0819-0524	5601
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22204	7590	01/15/2003
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EXAMINER
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TOLEDO, FERNANDO L

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/809,043

Applicant(s)

AOI, NOBUO

Examiner

Fernando Toledo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 November 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Due to the amendment filed on November 1<sup>st</sup>, 2002, the restriction requirement of Paper No. 8 is withdrawn. Claims 6 – 18 have been considered in this Office Action.

### ***Claim Objections***

2. Applicant is advised that should claims 7 – 10 be found allowable, claims 11 – 17 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 6 – 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown et al. (U. S. patent 5,962,113).

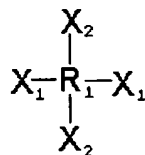
In re claim 18, Brown in the U. S. patent 5,962,113; figures 1 – 8 and related text discloses polymerizing first cross-linking molecules having a three-dimensional structure and second cross-linking molecules having a two-dimensional structure to form an

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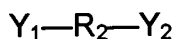
interlayer dielectric film composing a three-dimensionally polymerized polymer having a number of molecular pores (Columns 3 and 4).

In re claim 6, Brown teaches wherein the first cross-linking molecules are first organic molecules having a three or more sets of functional groups in one molecule, the second cross-linking molecules are second organic molecules having two sets of functional groups in one molecule, and the three-dimensionally polymerized polymer is formed by binding the three or more sets of functional groups of each of the first organic molecules and the two sets of functional groups of each of the second organic molecules together (columns 3 – 7).

In re claims 7, 11 and 16, Brown discloses the first organic molecules are represented by [chemical formula 1]



(wherein  $R_1$  is a first organic skeleton,  $X_1$  is a first set of functional groups, and  $X_2$  is a set of a second set of functional groups,  $X_1$  and  $X_2$  being same or different type), the second organic molecules are represented by [chemical formula 2]

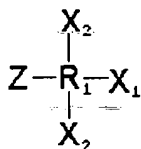


(wherein  $R_2$  is a second organic skeleton,  $Y_1$  is a third set of functional groups, and  $Y_2$  is a fourth set of functional groups,  $Y_1$  and  $Y_2$  being same or different in type), the three-dimensionally polymerized polymer is formed by binding the first set of functional groups and the third set of functional groups together and binding the second set of functional

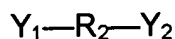
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groups and the fourth set of functional groups together, and the molecular level pores are formed in regions surrounded by the first organic skeleton and the second organic skeleton (Columns 3 – 7).

In re claims 8, 12 and 17, Brown discloses the first organic molecules are represented by [chemical formula 3]



(wherein  $R_1$  is a first organic skeleton,  $X_1$  is a first set of functional groups, and  $X_2$  is a set of a second set of functional groups, and  $Z$  is a third set of functional groups,  $X_1$  and  $X_2$  being same or different type), the second organic molecules are represented by [chemical formula 4]



(wherein  $R_2$  is a second organic skeleton,  $Y_1$  is a fourth set of functional groups, and  $Y_2$  is a fifth set of functional groups,  $Y_1$  and  $Y_2$  being same or different in type), the three-dimensionally polymerized polymer is formed by binding the first set of functional groups and the fourth set of functional groups together and binding the second set of functional groups and the fifth set of functional groups together, and then binding the third set of functional groups of the several units together and the molecular level pores are formed in regions surrounded by the first organic skeleton and the second organic skeleton (Columns 3 – 7).

In re claims 9, 13 and 14, Brown teaches forming an interlayer dielectric film 10 including a three-dimensionally polymerized polymer having a number of molecular

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level pores inside, by polymerizing first cross-linking molecules having a three-dimensional structure and a second cross-linking molecules having a two-dimensional structure; forming a barrier film on the interlayer dielectric film (column 2); forming a mask on the surface of the barrier film (column 8); forming a concave portion in the surface of barrier film and the interlayer dielectric film by etching the surface barrier film and the interlayer dielectric film using the mask (column 8); and forming an interconnection made of a metal material by filling the concave portion with the metal material (column 8).

In re claims 10 and 15, Brown teaches wherein the first cross-linking molecules are first organic molecules having three or more sets of functional groups in one molecule (column 6); the second cross-linking molecule are second organic molecules having two sets of functional groups in one molecule (column 7), and the three dimensionally polymerized polymer is formed by binding the three or more sets of functional groups of each of the first organic molecules and the two sets of functional groups of each the second organic molecules together (columns 7 and 8).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando Toledo whose telephone number is 703-305-0567. The examiner can normally be reached on Mon-Fri 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Fernando Toledo  
Examiner  
Art Unit 2823

ft  
January 9, 2003



Olik Chaudhuri  
Supervisory Patent Examiner  
Technology Center 2800